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foundations of electrodynamics

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Electrodynamics may be said to consist of two parts at different levels: microscopic and macroscopic theory. The first contains the laws that govern the interaction of fields and point particles often grouped into stable sets such as atoms and molecules and the second those that describe the interaction of fields and continuous media. The two theories are linked together, since the phenomena at the macroscopic level may be looked upon as being the result of the interplay of many particles. Therefore one should be able to obtain the electromagnetic laws for continuous media from those for point particles. Such a derivation, together with a discussion of the microscopic starting points, forms the subject of this book. The programme is carried out in the framework of both classical and quantum theory, both convari antly and in the non-relativistic approximation.

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